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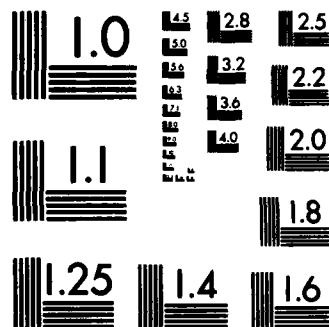
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THE 19TH INTERNATIONAL SYMPOSIUM ON APPLIED
MILITARY PSYCHOLOGY

N. A. BOND, JR.

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THE 19TH INTERNATIONAL SYMPOSIUM ON
APPLIED MILITARY PSYCHOLOGY

The 19th International Symposium on Applied Military Psychology (IAMPS) could fairly be said to "have everything," including several papers of methodological interest, some combat-oriented material from the Israelis, a variety of country and experimental reports, and a meeting site in a famous Danish castle. Despite universal budget problems and a few interdisciplinary hiccups, military psychology is alive and apparently well in the major European countries.

LTCOL Termohlen (Danish Air Force and the Danish Defence Centre for Leadership) made local arrangements for the meeting, held in Copenhagen from 6 through 10 June 1983. Ms. Susan Schlüter and LT Nils Bech were his on-site coordinators. Twenty-five members from 13 countries participated. (The attendance list appears at the end of this report.)

Two papers on integration of women into military services opened the technical sessions. Park (Canada) gave a progress report on the rather elaborate 1980-85 Canadian trial. The plan for that project included five environments:

1. Sea (HMCS *Cormorant*, Diving Tender)
2. Land (Combat Service Support Units in Germany)
3. Air (Crew Members in Near-Combat Operational Units)
4. Isolated (Arctic Circle)
5. Cold Weather Land (German Mountain Sites)

The number of women in each of the environments has been rather uneven, but with the exception of the cold weather land setting, the plan is generally being followed, and there have been no insuperable problems.

Park distinguished four organizational features that influence the acceptance of women:

1. Unit formal organization
2. Unit informal organization
3. Unit operations
4. Unit manning composition.

"Discriminatory" or "integrationistic" factors are more or less discernible in each of the categories. On the formal side, the official view is that women are simply crew members. But immediate supervisors may have their own ideas about women being aboard a naval ship or working in a field military unit, and such attitudes cannot be changed readily by formal instructions. Another example of formal conflict concerns male/female attachments at the the Arctic Circle Station; though pronouncements can be issued and nominally accepted by all hands, attachments are formed, and they simply cannot be controlled by top management. An implication is that new kinds of flexibility will be required of managers. (See the discussion of the Schlüter paper, below, on the same topic.)

Informal organizations can always be expected in any sizeable unit of people: there will be cliques, friendships, special in-group norms and admittance procedures, hierarchies, and so forth. The North Alert Station is the most northerly inhabited place in the world. There, the informal norms, along with expectations such as the "civilizing" effects which women bring to the site (less drinking, fighting, and profanity), seem to favor the acceptance of women.

Unit operations and the nature of the work done have a complex relation to the presence of women in "real" military settings. Aboard the *Cormorant*, which is staffed with a total of 72 people, women often perform "hard sea" tasks in addition to handling support duties as clerks and or technicians. Because of this enlarged set of duties, it quickly becomes clear that women really can do "hard sea" tasks (every private yachtsman already knew this). However, there may be some insidious comparisons made. If a slender young woman has to handle rather heavy ship equipment or perform

certain deck-hand duties, she may not be up to usual male standards in those jobs.

An interesting observation on one ship was that on two occasions women were "scapegoated" when the ship had mechanical troubles. As there is a fairly well established "psychology of scapegoating," it may be useful to see if the academic research on the topic would be useful to the Canadian investigators.

Park's paper ended with a notice of the "fishbowl effect" in the women's evaluative trials. Women are noticeable for several reasons: e.g., they still rarely serve on ships, they are known to be self-selected volunteers, and the entire community knows that the roles of women are still being sorted out and evaluated. These factors, along with provisions such as sex-based housing, probably make many women think that they are in a fishbowl and are far more visible than their male counterparts. Such perceptions can have both positive and negative effects on acceptance and performance.

Schlüter (Denmark) started her paper with a tabulation of reasons for "retirement" of women from the Danish Navy project. Out of the 61 female volunteers who were accepted, 49 are now serving and 12 have retired or left the program. On a questionnaire retirees gave mainly private reasons: separation from family, unsatisfactory adaptation to the rather spartan military environment, feelings of wasted time, and so forth.

The Danish Navy School experience with women has been highly positive; except for their handling of guns, women performed well in the schools, and there were no problems with accommodations or with inter-gender relations in classes and courses. Operation of present naval guns does impose strength and height requirements that exceed the capabilities of many females.

On board Danish ships, there really have been few surprises. Women can and do perform a great majority of the tasks

expected of them, although in any specific situation one can cite occasional instances of inadequate performance. Healthy young men and women living together in a crowded and previously all-male environment will experience strains and problems in adjusting to each other; there will be some matching, which can extend to sexual relations ashore and even afloat. Schlüter's view matches that expressed by Park: such behaviors cannot be effectively directed or controlled by edict. They can, however, be worked out in much the same way as matching problems as in offices, institutions, and factories everywhere--through individual management and a flexible acceptance by top administration that some matching will occur, and that most such attachments will not require command attention.

Accommodation is sometimes a problem, and again the main findings are rather banal. For instance, if bathing facilities are shared between the sexes and one woman taking an shower can "lock out" men from their usual toilets, there will be male resentment (such events are cited endlessly by men, according to Schlüter). Accommodations on patrol and minelayer vessels are intrinsically marginal, even when all personnel are male, and the situation is simply worsened if women have special facilities. The design of succeeding generations of ships will undoubtedly improve some of the conditions for all hands, but there will always be some dissatisfaction because of the space constraints. Female uniforms are a minor but significant cause of irritation to some male ratings, probably because the female uniform resembles that of an officer.

In a comment to these two opening papers, a Netherlands representative observed that in the Dutch Navy, top management is now concerned about the pairing aboard ship. Some couples left a Dutch Navy ship and stayed in American hotels together on a recent "goodwill cruise" to the US. Apparently the liaisons were widely known aboard ship, and they appeared to have detrimental

effects on morale. At a coffee time followup, it was difficult for IAMPs attendees to formulate a foolproof way of managing such problems. "Acceptance" and "flexibility" considerations on the part of command are obviously necessary. But they may be insufficient on some occasions, and perhaps in some military circumstances matching simply will be forbidden. Attitudes might be similar to those regarding the use of hard drugs in the military: a commander who could tolerate some occasional "recreational" use in his troops might be strictly opposed when the operation of dangerous machinery is involved in hard training or in real military operations.

Rock's paper certainly had one of the most intriguing titles in the symposium. The "butter-bar blues" refers to the situation of a new second lieutenant, fresh out of an American ROTC or OCS program, who reports in Germany as a new Army platoon leader. Here he is, with his gold butter-bar glittering in the Deutschland damp; but often he is not at all well trained in how to run a platoon of more or less experienced soldiers. He's had courses in leadership, of course; the trouble is that the problems of running a platoon are not usually soluble by displaying some general leadership traits, such as decisiveness or willingness to take responsibility. There may be no reliable checklist of things to do, and the new official platoon leader may have to rely on his platoon sergeant to find out what the leader is supposed to do.

In an interview project with a sample of platoon leaders and company commanders, Rock found that a "sponsor" program for the new "butter-bars" was not very effective. Most new platoon leaders were not met at the airport by their sponsors upon arrival, nearly half had their sponsor changed soon after arrival, and some had no effective sponsor at all. More importantly, some new platoon lieutenants apparently were afraid of their company commanders and were also afraid to admit errors. Company commanders do not regularly train their platoon leaders, either. In

fact, there were indications that much of the training is done by the platoon sergeant; there was also the perception that much of the running of a platoon is done by the sergeant. Regarding that key enlisted figure, some interesting findings on trust were obtained; the platoon sergeants said, for example, that they wanted the trust of their lieutenants. But they were also reluctant to grant that same kind of trust to their nominal superiors.

Standard task-analysis and training requirements studies could ameliorate some of the "butter-bar" problems, as Rock recognized. Nevertheless, it was remarkable that in the "backbone" units of infantry and armored forces, an adequate training analysis has been imperfectly realized for so many years.

In the presentation by Ebenrett (West Germany) on the "Disciplinary Situation in the German Armed Forces," some rather surprising figures were presented. From 1972 to 1982, there was a decrease of about 60% in simple disciplinary measures, with the major shrinkages occurring in the "restriction of pass" and "fine" categories (reprimand and strict reprimand occurrences appear to be nearly constant since 1977). To Ebenrett, the statistics do not imply a radical improvement in behavior, but rather a changing conception of punishment. Educational measures such as rebukes, warnings, exercises, repetitive drills, "tours," and duty roster changes have supplanted a large proportion of the disciplinary measures that were administered previously.

Rank makes a profound difference in the disciplinary penalties awarded. Officer penalties are mostly reprimands, but reprimands for privates and NCOs were far less frequent. Only about 11% of disciplinary cases in the privates were resolved by reprimand; in nearly 73% either a fine or restriction of pass was imposed.

The Military Disciplinary Code in West Germany is supposed to provide penalties "...with the purpose of bringing the rebuked person to

reason/understanding"; clearly, this is an educational objective, even though the methods of achieving the objective are not spelled out. All ranks, however, perceive that "fear of penalties," "fear of career disadvantages," and "fear of discrimination in duty" are very important motivators, and such fears are perhaps more potent than the educational function. Also, lower-ranked people do not believe that their superiors can adequately take into account the "special circumstances" of each case and the "overall personality" of the rebuked person, even though the code expressly mentions such factors.

Traditionalists can find things in Ebenrett's results that support "old-fashioned" ideas of military discipline and control. Soldiers do see disciplinary measures as effective and necessary. The same soldiers, though, do not agree with the "educational" motivation or the judiciary competence of disciplinary superiors. Ebenrett's evidence for change in disciplinary practice over the years is one of the best documentations of the liberal social forces of the last two decades. None of the IAMPS attendees knew of similar delinquency and penalty tabulations for their own countries.

Tolcott's paper on manpower issues in the US Navy mentioned many topics in manpower management; a novel feature was that it also gave, for each main category, some military-sponsored research on the issue.

Tolcott treated five issues:

1. Increasing Naval manpower demands (planned increase from 460,000 to 539,000 people from 1980 to 1986, with a bigger fraction of "highly qualified" people in the pool).

2. Decreasing supply (17- to 21-year-old population shrinks from nearly 11 million in 1980 to a projected 8.2 million in 1995).

3. Trends in retention (half of first-termers re-enlist at present).

4. External uncertainties (quality of recruit input, attitudes toward military, political continuation of

all-volunteer forces concept, and so forth).

5. Policy strategies and options (e.g., reduce personnel demands, expand source pool, increase retentions, robotics).

A few examples will give some flavor for the way that US research and personnel commands have responded to the issues. From 1974 to 1982, the proportion of Navy people in the top (Cat. 1) mental category declined by more than half, from about 9% to 3.6%. At the same time, much of the equipment has become more complex. What to do? One approach is to automate, aid, and predict people workloads on new systems. Concepts from systems engineering and applied statistics are being used so that new task requirements will be more manageable. Computer-driven training and aiding packages are already routine in areas such as carrier-based jet maintenance; such applications will expand drastically by 1990.

Older people can be recruited and adapted to the military situation. There is no intrinsic reason why an experienced, 34-year-old TV technician could not enter the Navy at one of the higher technician ranks. "Work group research" is illuminating some of the factors underlying productivity. "Marketing" studies of personnel recruiting can assist; one research contract showed that in the American-Hispanic target community, which now numbers in the millions, the recruiter would be wise to spend more time with the recruit's family. Comparative evaluations showed that local advertising was more effective in attracting good candidates to recruiting centers. It helps, too, if prospects are given realistic job previews about what will be encountered in military life. Stress-coping skills can be learned, and "life support" factors are being better explicated all the time.

The scale of the issues that Tolcott presented, and the size of the research programs addressed to them, certainly shows that adequate research

techniques are available and can be profitably applied on almost every segment of human factors utilization. Perhaps the most drastic of Tolcott's research projects are those involving decision aiding; where really effective aids have been fashioned, it is clear that the human is not just "engineered out of the system." Rather, a complex integration of aided-human with the military situation is achieved. Effectiveness of such aided systems can radically exceed previous arrangements of men and machines.

Acda (the Netherlands) had a crisp logical structure for his paper on "military management." He showed, for instance, that it is ridiculous to talk about good military management as embracing a standard set of control rules, human interaction expectations, decision variables, and outcome measures. After all, when the critical characteristics of organizations are listed and applied to military settings, the field settings may be radically different. The "specialization," "standardization," "centralization," and external situational constraints in a small-group psuedo-combat setting (North Ireland ground patrol) are very different from those which exist in a large "bureaucratic" technical environment (mapping of the ocean bottom by a research vessel). Thus, one is simply not talking of the same organizational challenge in the two cases. Disparate leadership and control approaches must be used in such settings. There is reason to think that the same leaders could not possibly be "optimal" in both situations, even though the military party line often is that "a good officer can run any organization well."

Even though military management cannot be interpreted as a single unitary enterprise, the management aspects of each of the prevailing field settings can be studied profitably. The key is to have relatively clean evaluation and performance feedback, and Acda had some novel proposals here. Modern combat loads such as those encountered in the Falklands and in Lebanon are,

fortunately, rare. But Acda noted that many peacetime operations (sea-air rescue, hydrographic projects, communication, occasional joint political "mop-up" operations) do present psuedo-combat conditions, and it is possible to envision "scores" for units and individuals. Scoring by direct and indirect schemes would allow an adaptive feedback loop around the military system and lead to improvement.

In Stracca's presentation on motivating agents in Italian Naval cadets, a general schema of motivation was outlined. A key part of the schema was a "values" black box, which could accommodate some of the more complex and less studied motivational phenomena. Stracca has also been performing empirical studies using instruments such as the "Who am I" biographical blank and Gough's California Personality Inventory (CPI). In the Italian Academy, "Leavers" (N=509) and "Stayers" (N=387) sometimes had significantly different scores. Stayers seemed to have slightly higher "aggression" and "order" needs, for example. The mean differences were not great, however, and it took an automatic statistical tabulation to discover them in the matrix of 25 or so scores.

Nearly all CPI scores in the cadet sample were "higher" than the usual norms, showing that the ordinary screening programs were probably effective in eliminating many applicants who had tendencies toward neuroticism, low drive, and poor mental efficiency. One of the most interesting features of Stracca's project was the attempt to look at cadet motivation from several different levels of discourse. According to Stracca, a critical concept is the interaction between the motivated (or unmotivated) person, and the situational demands of the cadet life. Successful cadets are just those whose "normal" motivational pattern is able to "grow" under the military school challenge; unsuccessful people in the academy do not experience the challenge as growth-directed, but rather as self-defeating. A commentator wondered

if a simultaneous measurement of cognitive style preferences would elucidate further the questionnaire findings that Stracca reported.

Wheatley's paper on "Territorial Army" recruiting in the UK must have caused some vestigial twinges in IAMPS attendees who were active in World War II. The Territorial Army consists of part-time civilian volunteers, but it is by no means just a weekend drill operation. Recruiting and selection take place in 19 university OTC centers and in area recruiting offices. Formal basic military training is necessarily limited--about 2 weeks of an in-camp course and another week out of camp. Nevertheless, physical and ability components are quite high, and Wheatley's test battery clearly is not an instrument for below-average weekend soldiers who want to play at being in the army.

For standardization and "conversion" reasons, the Territorial Army tests must parallel those now being used in the regular UK army. Vocabulary and matrix reasoning materials are being intensively studied and item-analyzed. A validation sample size on the order of 10,000 recruits has been planned over the next year or two. One military preview procedure allows candidates to select themselves out. During a strenuous orientation weekend, candidates are awakened early, take long runs and cross-country hikes, and get a good taste of Army demands. By means of such screening experiences, camp attendance by those who pass the recruitment barrier is considerably higher.

Physical and mental standards for the Territorial Army are probably higher than those in most other countries, and the present economic conditions in Britain permit low selection ratios and high cutoff scores. When Wheatley's item analyses are completed and the statistically oriented test assembly proceeds, this should be one of the best researched selection batteries in military psychology.

Böhrer's investigation of self-report personality measures was probably the major methodological study in the 19th IAMPS. He used a free-response self-description method, a one-item self-judgment format, and a standard personality inventory. The personality inventory (five personality factors test, or 5PFY) consisted of 70 items, with 14 on each of five factorially derived subscales: extraversion, agreeableness, conscientiousness, neuroticism, and general culture. (The factors resemble some of those in R.B. Cattell's system.) For the free-response task, the respondents were given the following instructions: "describe your personality, as completely as possible, listing ten adjectives....Try to use words of common usage." Judges then rated each adjective for how "...extravert, agreeable, conscientious, neurotic, and cultivated" a person would be if the adjective were to apply to him or her. A standard numerical scoring system was used by the judges, and the total trait dimension scores were obtained by summation. For the one-item self-judgments, the "best" item in each subscale was taken to represent a dimension: e.g., "punctual" would indicate membership in the "conscientious" dimension.

Böhrer wanted to explore the correlations among the three measures of the same five personality factors; he also wanted to get some data on their validity. As a criterion measure, he used a long behavior rating or "behavioral manifestation" form. The form described "home" and "friends" situations; for example: "At home he or she gets up without delay when waked in the morning" probably represents behavioral manifestation of the inventory item "...energetic, vivacious, quick, alert; always 'all right.'" There were 100 items in the final forms, which were confidentially completed by the father, mother, and friend of each of 79 students in a Belgian high school.

Correlations of the free-response adjectives and the one-item score with the SPFT criterion were rather high

(about 0.60), but the two measures correlated with each other only about 0.40. The correlations of the three self-rating scores with the criterion behavior form were about 0.20, so one might conclude that the methods have the same (low) validity.

It was when Böhrrer investigated order effects that the surprise came: the validity of the three methods is markedly higher when the free-format method is done first. Böhrrer confirmed the phenomenon in a second study with a small but entirely new sample. The amplifying effect, which has not been observed previously in the psychometric literature, certainly deserves further explication. Böhrrer thinks that it may be that the free-response task "taps more of the behavioral information" than do the fixed formats. Once the information is sampled and retrieved from long-term memory, it is "energized" and used in all the later self-rating efforts. Self-knowledge becomes more available to the subjects. Whatever the eventual generalizability of Böhrrer's validity-raising effect, it is likely to be pursued in psychometric laboratories around the world. As in Gal's Israeli studies of "heroism" reported at the 1980 IAMPS, some IAMPS papers appear to be truly seminal.

Sharrock not only described the new RAF simulator for training the NIMROD electronic operators, he also gave an interesting review of the way that big simulator projects evolve in defense ministries. The usual military preference, as Sharrock noted, is to train in the "real situation." In the NIMROD case, this would mean that you would fly many hours over the sea, obtaining and analyzing real data from sonobuoys that have been planted previously in the ocean. But by the late 1970s, fuel and other costs of running practice flights became prohibitive, and training simulators appeared to be the only feasible alternative. However, military training commands seldom give the simulator designers and the training research people a free hand; there are always delays, policy reviews, and

reversals of position. Progress toward an advanced computer-based teaching system is seldom smooth.

The advanced NIMROD teaching system includes a B600 minicomputer that classifies targets by a pattern-recognition scheme. The raw lofargram signals are highly processed, first by feature detection and parameterization subroutines and then by the application of stored rules and "matching" tests. The computer output is a preliminary classification of the signal data. While the human operator cannot really change the front-end signal processing, he may be able to "tweak" the system.

When a computerized system like this becomes available, it can be an ideal practice vehicle for teaching students. Quality of input data can be controlled, for instance, and difficulty of problems can be stepped up as proficiency increases. An important part of the NIMROD operator's training becomes his experience with the computer-aided classification system. Eventually, the electronic operator's course schedule will look like that shown in Table 1, with nearly half of the school time devoted to the computerized classification aid.

The cost of a computerized teaching station, at the present state of the art, is about \$125,000 (\$200,000). Most of the money, at least in the early models, is for software development.

The students and instructors respond positively to computer-aided classification, both as an operational aid and as a teaching device. There is still some command skepticism, but it can be expected to diminish with time. The situation may resemble the introduction of computers into manufacturing and the insurance industry. Two decades ago, managers feared that the new-fangled computers, with their mysteries and their swarm of programmers and other specialists, would be difficult to understand and to control. Gradually, most managers came to terms with the contributions that data processing systems could make; gradually, they became comfortable with such systems.

Table 1
Course Schedule

<u>Content</u>	<u>Hours</u>
Conventional classroom teaching	150
Computer-aid instruction (CAI)	25
Simulation and CAI, Lofargrams	110
Simulated "graded" practice	40
Total	325

Succeeding generations of managers have at least minimum technical competence in the hardware and software systems. All this took many years.

Sharrock's presentation showed how an advanced signal-processing system can be integrated into military operations and training at reasonable cost (some US aircraft simulators cost millions of dollars). As advanced as his lofargram classifier is, however, it is not truly interactive. To be truly "interactive" and "adaptive," the man-machine interaction would have to be such that the human operator could change, modify, or bypass some of the rules of its software. Right now, the human operator can "take the computer's output with a grain of salt"; but he can hardly reprogram it to match the conditions and capabilities of the moment. The next generation of target classifiers will probably reflect some of this true interaction between man and machine.

In Finland, Lasse Nurmi recently did a survey to study the contribution of Finnish psychologists to the country's military forces. It turned out that only about 15% of Finnish psychologists contributed to military call-up examinations and the like. Nurmi attributed this to the fact that a majority of Finnish psychologists are women; male psychologists, who generally had military service behind them, were far more eager to participate.

Finland will reduce its annual conscript intake from 36,000 men to 26,000 within the next 7 or 8 years. While this permits a selection policy with higher cutoff scores, it also implies a more advanced classification system than the one being used now. Some Finnish studies are going forward on the measurement of stress-coping skills, of achievement motivation, and of "leadership willingness." Finland's unique position as a neighbor of Russia and two other Scandinavian countries may lead to chronic military-psychological phenomena that deserve attention by the West. While the Finns laughingly say that they have had dozens of wars with the Russians and have lost every one, they are still strongly independent of Russia and the populous countries to the west. Does "toughness" require special explanatory mechanisms in military psychology?

Moshe Even-Chen is a psychologist and an officer in the Israeli army. During the 1982 operations in Lebanon, questionnaires were completed by active infantry and armor personnel, who were able to report on items such as lack of information, trust in commanders, trust in peers, personal fear, and so on. "Trust" feelings were often near zero, and "morale," as ordinarily defined, was low in some samples. In fact, the total rate of "combat reactions" was notably higher than in the 1973 war. Even-Chen believes that some of the results can be

ascribed to the fact that military technology is more advanced. Nobody is safe. More shells and bullets are being delivered, they are more accurate and more destructive, and there are very few dugouts or shelters such as those used in World War II. An additional possibility, for which no hard data were available, is that the people have become less tough in the past decade, as the standard of living has improved throughout the Middle East.

Even-Chen raised the intriguing possibility of the "illusion of information." Radios work more reliably than ever before, so there is incessant data transmission from, say, a brigade headquarters to tank and platoon units in the field. But much of what is sent and received is not "real" information that one can use immediately for one's own infantry or armor situations. One can perceive, albeit dimly, future military communications systems that do not simply flood field people with everything conceivable, but allow for "graded" qualitative communications demands that will favor effective communications data. There is obviously room for human factors research on these possibilities.

The "Salmon principle" advises that the treatment of choice in combat reaction cases is to return the affected soldier to his unit as soon as possible. Give him some rest, but do not evacuate him to some rear-echelon center, and he will shortly rejoin his unit. Even-Chen gave some data that generally validate the Salmon principle.

The return-to-unit probabilities appear to be rather disappointing, whatever the treatment: in fact, they are lower than some reported for the US forces in Korea and Vietnam. (Even-Chen observed that the reported return rates may be artificially low because of the mobility of units during combat.) An incidental finding, which was reported informally at IAMPS, was the near-zero rate of psychological casualties among British Army and Royal Marines in the Falklands war. Much of this remarkable

"resistance" to Falklands combat conditions may be attributable to the elite units deployed there, and to the relative brevity of the operation. Nobody has yet assembled and contrasted the Israeli and Falklands data in a single unified report.

Even-Chen summarized the factors that the literature proposed as correlates to combat reaction:

- A. Situational-unit factors
 - 1. Low cohesion level
 - 2. Lacking leadership
- B. Personal factors
 - 1. Lack of familial stability
 - 2. Physical injuries
 - 3. Lack of battle experience
 - 4. Feeling of loneliness within the unit
- C. Battle pressures
 - 1. Battle intensity, battle length
 - 2. Battle immobility
 - 3. Loss in battle
- D. Treatment approach
 - 1. Lack of prevention by isolation, rest, quick return to unit
 - 2. Lack of effective front treatment
 - 3. Inexperienced treatment crews

Because the evidence indicates that situational factors are probably more potent than personality variables, Even-Chen was able to formulate a persuasive situational model of combat reaction. To a soldier it may begin with deep uncertainty, or lack of information concerning the immediate situation and task requirements; the uncertainty undermines faith in his unit and diminishes his self-perception. If the unit does start to incur combat reactions, then unit pride, cohesion, and morale suffer, and there may result a general decrease in readiness to fight. Even-Chen postulates a sort of chain reaction here.

Some Israeli units experienced severe combat, and yet recorded almost

no combat reaction withdrawals. No doubt investigations of these "super-units" will be reported at later IAMPS meetings. It is already plain that on the subject of modern combat stresses, the Israeli and Falklands information bases are probably the best in the world. They should supplant many of the older reference sources on combat behavior.

Gial Eshroni summarized of the Israeli Navy Psychology Unit, which has grown a great deal since Eli Zevulun described its activities at the Lisbon meeting in 1981. Considerable counseling and organization of discussion groups takes place, and there are a few contacts with universities and institutes. Much of the research done at Naval headquarters relates to attitude and morale surveys, and here the categories of work (attitude toward Naval service, willingness to volunteer, and unit pride) resemble those in other survey organizations. As in other western-oriented countries, Israel has experienced the effects of decreased commitment to military service, and there is a strong Israeli political contingent that opposes military operations in the Middle East.

Screening activities for elite (Frogman) and technical occupations in the Israeli Navy often emphasize situational testing because there are few candidates, and it is often possible to set up tasks of high face validity. Human engineering is performed both at the planning level (for new equipment) and in the field. There is a special project on sea sickness; interestingly, that topic is apparently not being studied much now in the UK, US, or West Germany.

Leadership training workshops are routine in the Israeli Navy. As in the Danish leadership program, it is assumed that not all of the possible stress situations can be anticipated, so certain broad "principles" must be taught. But many routine leadership situations can be simulated and "walked through," perhaps by means of videotape evaluation of behaviors. Several IAMPS

attendees were interested in having a compilation of "leadership simulations" which are now being used. In the US, one such compilation was made for AID training programs a few years ago, and much of it may be applicable to military courses and workshops.

When real Naval operations are in progress, Israeli field psychologists often act as "personnel reconnaissance" specialists. They consult with commanders and crews on problems relating to morale, trust, and combat fatigue. If surveys and interviews are performed under operational conditions, the emphasis is on quick analysis of results and rapid feedback to command. As in all Israeli Defense Forces, the Navy wants to identify potential leaders, and field psychologists can participate in the selection process.

Roozendaal's topic was "Innovation in Military Schooling and Training." His treatment apparently was stimulated by one prospective educational innovation in the Royal Netherlands Army, but the theory and approach were extremely general, and indeed his paper is a good summary of what we know about implementing new teaching and training ideas.

There are three main strategies for bringing about an innovation:

1. Empirical-rational. The strategy is based on the idea that man is capable of rational thought and has to be persuaded of the usefulness of an innovation.
2. Normative-reeducational strategy. The strategy is based on the view that human attitudes and social conditions have to be changed in order for innovations to succeed and that this can only be achieved when people want it to succeed.
3. Power-coercive strategy. The underlying principle is that people conform to the wishes of those having more power.

For any given attempt to introduce innovation, each of the three strategies may be identified as critical during the

process. Straight coercive "ordering" of acceptance is not likely to be effective, for instance, unless the affected people can be prepared properly. A new product or procedure, no matter how rationally conceived or efficient, will not automatically appear to be desirable if it disrupts existing systems and established organizational arrangements.

Roozendaal's theoretical structure of the innovation domain took a specific form when he asked a sample of people in the military training community to respond to a questionnaire on new educational methods. A first result was that personal concern about the innovation was paramount. The critical thing is how the new method will impact one's own job, one's own status, one's own prospects and self-image; half the respondents gave this response. One finding was that only a few respondents were greatly concerned with improvements in efficiency, even though from a rational standpoint better efficiency was the real stated reason for the innovation.

This result reminds one of a standard puzzle in American grade-school education. It has been known for a decade that 20 minutes per day of computer-controlled drill and practice will improve children's arithmetic test scores by about 30%; thus, you can "buy" arithmetic achievement. The practice routines have been shown to work in environments ranging from schools in suburban California to those in Mississippi and West Africa. Complete systems--including time-sharing central computer, teaching programs, and maintenance contracts--are offered commercially (96 terminals for \$90,000), and can be installed within a few days anywhere on earth. Yet only a negligible fraction of big-city schools have purchased such systems. It is certainly rational to pay \$100 per child for this kind of teaching effectiveness, and good scientific documentation is available on the programs. The superficial explanation that school districts "cannot afford" such innovations simply

is not true, and questionnaire studies indicate that the public wants such innovations for its children. It is human resistance at teacher and staff levels that has scuttled most of the introduction of such new ideas.

Much resistance, Roozendaal found, is due to lack of information about a proposed innovation. Managers should take great pains to be sure that good information not only is available, but also is perceived by the "target" audience as being reliable and unbiased.

Roozendaal's data, as well as the underlying theory of acceptance of change, implies that making a major innovation is a long process. Computer-aided teaching for example, or provision for special simulator training may take years or even decades to be accepted and to become part of the system. Development technologists probably will be impatient at the rate of introduction of any given change. But while many hints are available for facilitating the acceptance process, sometimes none of these will drastically shorten the time. Some management principles are so universal that they sound like cliches, yet they may be forgotten frequently. Roozendaal shows us that perhaps the most general principle in the innovation game is that human perceptions of change are the key elements, and that any practices that favor involvement of the key "user" constituency are probably worthwhile.

Stoll's presentation was devoted to a realistic week-long trial of "underground center" facilities in the Swiss Army. The Swiss wanted to know, for instance, whether the present provisions for food and living conditions were adequate for long, underground tours of duty, and how the Swiss soldier would adapt to such a situation.

The trial lasted 6 days. A three-way, 24-hour time segregation was scheduled: 8 hours work, 8 hours "free" time, 8 hours sleep. Diary-type activity recordings were made of actual hours spent sleeping, eating, and so on. "Mood" was assessed on a five-point Morale Scale (top end, "good, cheerful,

relaxed"; bottom end, "bad mood, not content, listless, irritated, etc."). Unexpected water shortages and power failures were introduced during the underground stay. For 2 days, both water and air conditions were marginal, and for one 24-hour period during the 2 days there was no electrical power.

The troops coped quite well with water shortages and stale air. One interesting observation was quite striking, though: technicians who were expert in managing the emergency systems suddenly were very important, and in a way they were temporarily more important than the usual command. Military planners will have to consider the emergence of "technological power" in such circumstances.

It does not take a trained psychologist to postulate that peacetime practice simulations, like the Swiss trial, which everyone knows will end at a definite time, may not produce the same behavior as would a real wartime setting. The other side of that argument is that the major problems can show up remarkably soon in the special environment. Zimbardo's mock "prison" experiment, in which Stanford students became "guards" and "prisoners" for a few days, produced extraordinary dominance and even sadistic behaviors within a few hours, and the experiment had to be stopped halfway through the planned 2-week period. Stoll's experiment, which was conducted within a fairly conservative military structure, apparently did not produce drastic role shifts like those Zimbardo found. There are clear trends in the Swiss "Morale Scale" data about accommodation and "shift effects"; morale was at its lowest during the first afternoon and evening, when a long period of confinement still stretched ahead and there was much ineasiness. Work required in the middle of the night also tended to depress moods and attitudes, even though the usual diurnal cues were absent. More variability in behavior and attitude may occur as such trials go on from day to day. Data from submarine and Arctic Circle isolated duty stations

probably exist, but they have not been fully collated by the military psychology community.

In his review of decision-aiding projects in Europe and the US, Bond focused mainly on the "medium-size" configuration, which often features a standard minicomputer and displays that use very complex special software. Researchers in Europe and the West are doing important research in decision aiding systems. Much of the work falls into three classes.

1. Unburdening systems. Aids in this category do perform routine processing, thus freeing the human operator for high-level control and decision tasks. There are specific aiding systems for aircraft and submarine control, handicapped people, power plants, continuous process manufacturing, in-flight monitoring, and many other applications. European theoretical work in estimating human mental capacity is at the edge of the art, with leading laboratories in Britain and Holland.

2. Diagnostic systems. Expert systems and other computerized diagnostic aids attempt to condense in a compact, portable package an individual's or a technology's specialized information. European prototypes include the Pourbaix-Michie metallurgical expert system, now under development at Oxford; the anesthesiology support system at Aachen, West Germany; and various automatic cytological classification schemes in all the developed countries. "Hit rates" for such systems may get up to the 80 to 90% range, and the impact is beginning to be felt in national screening programs. The incorporation of a mental model permits the human operator to salvage something when the system crashes, or when environmental circumstances have a larger-than-expected variance. One further trend is discernible in many diagnostic aids: human "mental models" of basic physical processes are included in the systems.

3. Structuring systems. For many complex problems, the most effective system does not attempt to compute a "best answer" or tell you what to do next; rather, it organizes, displays, and tests the inputs so that the structure of a problem becomes more evident to the decision maker. Such aiding packages are general and content-free; they elicit systematic probability and utility judgments from people. One working European system is MAUD (London School of Economics), and there are several others.

Bond pointed out that interactive graphics capabilities are gradually being added to European decision-aiding packages as computational power increases. Within a short time, say 3 to 5 years, stand-alone computerized aids will have significant drawing, display, and perspective transformation capabilities. The next generation of simulators should have spectacular capabilities, and at least some of the human problems can be identified already.

There are serious implementation problems with nearly all decision aids and computerized assisting devices. Sharrock's earlier account of command skepticism about a very effective training aid is one illustration, and several others were mentioned during IAMPS papers and at informal rump sessions. The psychologist has to do more than build a "good" procedure or system. It is clear from the history of the data processing industry, for example, that most technological innovations are seen as threats by people working in the present system, and the new proposal is often interpreted in personal terms. Resistance can be reduced in various ways, in accord with academic social psychology. IBM has a practice of introducing new troubleshooting programs to its field technicians by sending the technicians to the factory to help prepare the new materials. The same principle of "join 'em, don't fight 'em" could apply in new military technologies. Another

important factor is the definition of a constituency for a new technology. Unless one can visualize a constituency that really needs the innovation and would benefit from it, then resistance can be predicted. There seems to be no "handbook of implementation" for military psychologists, and it would be useful for somebody to assemble a list of the major variables that control an implementation effort.

Chatigny's subject was the "Role of Military Psychologists on the Battlefield"; and he laid out some of the main ways that behavioral science can help improve combat effectiveness. Using some recent Israeli experiences as an immediate starting point, there are at least half a dozen areas where contributions can be made:

- Psychological casualty prediction and alienation

- Cohesion and morale measurement

- "Primary group" formation and maintenance

- Assessment center and other special testing

- Operational consultation with commanders

- Selection schemes (e.g., Geographic "Regimental" concept).

Sometimes new psychological problems emerge from the matrix of modern weaponry. Right now, as the 1982 Lebanon War showed, "smart" weapons are so accurate that the logistics and rear-echelon communications personnel may be at even greater risk than front-line tank operators. (In the Yom Kippur War, Israeli logistic troops had relatively high psychiatric/physical casualty ratios.) Chatigny observed that nearly all military psychology has clear roots in academic and experimental psychology. Findings on potency of group cohesion and the importance of primary social groups were being published 50 years ago by Lewin and his colleagues. Human engineering of controls and displays proceeds from handbooks that were compiled primarily during the aerospace boom of the 1960s.

One participant wondered whether there were academic results and concepts that the military psychologist is not yet applying.

Chatigny's paper occasioned some informal discussion of "human reliability"; now that the education of field commanders includes the rudiments of probability theory, commanders often would like to be able to put reliability numbers on unit military performance. In some situations, the Swain model of probability summation can be used. But there are intrinsic problems with adding or multiplying likelihood indexes of human task completion when the human can restructure the tasks into a variety of composites. Psychologists probably will solve the problem--if it can be solved.

Siomopoulos was the first IAMPS attendee from Greece in several years. As a Greek Air Force psychiatrist, he has been reviewing many military delinquency and suicide cases. The Mediterranean countries are in rapid social evolution; nearly half of Greek post-graduate professional students are now women, for example; that proportion would have been unthinkable even a decade ago. Applied psychological research in the Greek forces is expected to grow during the next few years, and there will be intriguing special problems, and special opportunities, for military psychology.

Two papers (Böhrer and Ebenrett) were devoted to computerized test stations, and particularly to "adaptive" testing. (In adaptive testing, the difficulty level of each subsequent item is adjusted according to previous item responses, and continues only long enough for the estimated standard error of measurement to reach a previously specified level. Time savings on the order of 50% can be expected.) The hardware and software packages used by the different countries work well, according to all reports. Böhrer finds that it is advisable to use three items instead of one for the initial "adaptive" assignment to a new level of difficulty--presumably because the reliability of the three-item response

is greater. Ebenrett's discussion gave a favorable report on his experimental test stations in the German forces. There are German and Austrian psychometrics experts in the adaptive testing arena, incidentally. Models derived from Lord and his colleagues now dominate US adaptive testing, and perhaps papers at future IAMPS meetings will cover the strictly European contributions.

The last paper, by Böhrer, was an account of the leadership training program in the Belgian forces. When such programs are contemplated, a standard response is often to set up an entirely new institute. In the Belgian case, Böhrer's analysis suggested that it probably would be best to take an existing leadership-oriented group from active units (a ship, a wing, and so forth), and thus to use the experience of human-oriented groups that already exist.

The main concluding business item was site selection for 1984; Belgium extended a tentative invitation, which was immediately accepted by the attendees. If official approvals go through, Arnold Böhrer will be local arrangements chairman, and the most likely sites will be Brussels or Louvain.

In August 1983, Richard Snow will replace Nicholas Bond as liaison psychologist at ONR London. Snow will be program chairman of the 1984 and 1985 IAMPS sessions.

Anyone attending the Copenhagen meeting could say that IAMPS psychologists represent rather well the spectrum of applied psychology today. There is every reason to expect much interesting research in the years ahead, and a gradually increasing awareness of the contributions that psychology can make to military effectiveness.

An observer might also say that military psychologists, in their present staff posts and reporting structure, necessarily operate within a quite narrow focus. They study some new selection procedure or innovative training scheme, they analyze surveys of one kind and another, and they respond

to some command urgencies. There seem to be no or few "grand old men" in the field, and there are few syntheses of military psychology that resemble, say, Roscoe's text on aviation psychology.

It might be well if the IAMPS community, which is now fairly well stabilized, could produce a synthesis of the state of the art for the main categories of military psychology.

APPENDIX

Participants in the 19th International Symposium on Applied Military Psychology

6-10 June 1983

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